Catawba County Public Safety Interoperable Communications Plan

Planning Background:

Catawba County Government
Technology Strategic Plan
June 2007

Initiative 6.2

Build a reliable communication network that provides for interoperability across the County. The County has a reliable radio network in place but it is limited by several factors, 1) it is a voter receive system that leaves some areas without communication depending on which tower signals originate from, 2) Hickory has an 800 Mhz system which does not allow for communications between Hickory PD and other emergency services, and 3) there is no data capability in the current system. Each of these areas diminish the level of service that can be provided by Public Safety and need to be addressed. (See appendix for more detail)

Catawba County Government
E911 Communications Center Strategic Plan

Recommendation 4.1

Form a partnership with the North Carolina State Highway Patrol to move to the VIPER system. (This recommendation is the same as 2.1) The VIPER network was built for public safety interoperability across the state. It works off of an 800 MHz trunked system. Current coverage in the Catawba County area is good and will provide even more coverage with the addition or upgrade of several tower sites.

The Public Safety Information Committee recommends that we move to the 800 MHz system over the next five years. The first agencies to convert would be Law Enforcement and EMS. They would use the current VIPER infrastructure with other agencies using the current VHF system. The two systems would be connected in the Communications Center. At the same time, Catawba County would work with the NCSHP to complete the construction of the Riverbend Tower and upgrade to the NCSHP tower on Baker's Mountain. Catawba County would also apply for grant funding for a new tower in Newton and for matching funding for 800 MHz radios.

The existing VHF network would be left in place for agencies using the VHF radios until they are all replaced. At that time, the VHF network would become a backup for the 800 system.

Introduction:

While there has been significant work completed by state and local agencies to ensure interoperability with jurisdictions across the region, much work still remains.

In order to provide communications to properly respond to emergencies and possible terror attacks, many partnerships have been formed and much of the infrastructure has been put in place and tested. Partnerships like the Piedmont Area Communications Council (PACC) has worked to deliver voice and data services for regional public safety related activities across Anson, Cabarrus, Catawba, Gaston, Iredell, Lancaster, Lincoln, Mecklenburg, Stanly, Union, and York counties. The North Carolina State Highway Patrol's VIPER system is another very powerful tool in providing interoperability across the region. This system allows for communications with any other agency on the system from one end of the state to the other. For the region, it allows counties to communicate with each other and assist with mutual aid without having to establish a complex temporary communications link. The system allows for a multitude of flexibility across the state in normal and emergency situations. Again this is a tested and very reliable system.

As stated above, infrastructure is in place and working very well. Now it is time to take it to the next level. While most regions, counties and municipalities can communicate, this is on a limited basis. The system has not reached sufficient critical mass to ensure that all communications centers are properly equipped to provide services to their agencies and the agencies themselves have limited ability to take advantage of the infrastructure that has been built.

The problem defined in Catawba County and the municipalities within, is how to ensure that local public safety agencies can communicate seamlessly within the boundaries of Catawba County, as well as, with their counterparts across the region. This should be accomplished using the most reliable, yet user friendly, technology possible. Currently the Catawba County E911 Communication Center is not equipped to provide interoperability on a wide scale with other agencies in the region should the need arise. Likewise, local public safety is not equipped with a solution that allows wide spread interoperability.

This plan provides solutions to both of the problems listed above.

Proposed Solution:

Catawba County plans to upgrade the E911 Communications Center with capacity to handle sixteen 800MHz VIPER talk groups and provide local public safety with mobile and portable 800MHz units. As stated above, the Communications Center has limited ability to connect to the 800 MHz system. The current ability has allowed the County to test the reliability and coverage of the VIPER system and it has provided proof of concept. However, expanding the use of the 800 MHz system is limited by the number of radio units and supporting infrastructure.

In the field, use of the 800 MHz system is limited by the number of field units. This plan will equip EMS, Rescue, Fire, Emergency Services, Law Enforcement, Public Health and Animal Services with 800 MHz field units and build the critical mass that is needed for true interoperability.

It should also be noted that this is an upgrade to 800 MHz in the Communications Center and with field units. It is not a replacement. Catawba County plans to leave the current VHF system in place and to continue to support it. This is to: 1) provide a phased in approach to the 800 MHz system and 2) provide a redundant communications network for the County. This plan will allow both systems to converge at the Communications Center level and interoperate with each other within and outside of Catawba County.

By upgrading the E911 Communications Center's 800 MHz capacity and providing field units to public safety, Catawba County will be able to communicate effectively within the County and with public safety agencies across the State and at the same time, build a redundancy into its communications network.

Outcomes:

1) Catawba County will improve its ability to communicate with regional groups like the Piedmont Area Communications Council (PACC).
2) Catawba County will improve its ability to communicate with surrounding counties.
3) Catawba County will improve interoperability among responders within the County.
4) Catawba County will provide a phased upgrade path to the 800 MHz system.
5) Catawba County will build redundancy into its communications network.

Historical Background:

In 2005 Catawba County received a PSIC Grant in partnership with the NCSHP. The grant was signed over to the NCSHP to construct a tower for the VIPER system on Riverbend Road. Construction of that tower is in the beginning phases. This plan builds on the work started by the 2005 grant and enhances interoperability in the region.

Current Status:

Currently Catawba County has 800 MHz coverage across most of the county via the VIPER system. The Riverbend tower is in the process of being constructed in the northern part of the county. This tower was funded with a 2005 PSIC grant and signed over to the NCSHP. It is anticipated that this tower will provide coverage across the entire county.

The E911 Communications Center has eight 800 MHz radios. They have been used to test coverage across the county and tested by the Sheriff's Department in areas where the current VHF system is not available. For example, there is no or spotty VHF coverage on Lake Norman.

The Sheriff's lake patrol is using 800 MHz as their main communication device in that situation. The Communications Center has patched that 800 talk group into the VHF system.

EMS has several radios that they have been placing with different units and different personnel to test coverage. Emergency Services has also been testing 800 MHz units and has units in the EOC and in the mobile EOC for interoperability.

Partnerships and Interoperability:

Catawba County has been a member of the Piedmont Area Communications Council since its inception. The purpose of this council is to guide the development and implementation of the regional public safety radio interoperability system. This system provides for the delivery of voice and data services to support the on-going regional public safety related activities in Anson, Cabarrus, Catawba, Gaston, Iredell, Lancaster, Lincoln, Mecklenburg, Stanly, Union, and York counties. Through the Catawba County E911 Center, links can be established that allows local public safety personnel to talk with personnel in the other counties. Catawba County plans to build on this existing infrastructure and working relationship to enhance capabilities and expand them to more public safety personnel.

Other regional agencies that will benefit from this plan will be the surrounding counties. Communications directors and technology representatives from Burke, Caldwell, Alexander, and Iredell meet on a regular basis to discuss and review the direction each county is moving in and seek solutions that enhance public safety and interoperability. Each of the counties has a plan similar to the one being proposed here and providing for complete interoperability on a number of talk groups.

Within the County, this plan will enhance interoperability with each of the municipalities in each area of public safety. The project will address compatibility issues with the City of Hickory and bring true interoperability to law enforcement and EMS..

Technology:
The North Carolina State Highway Patrol (NCSHP) operates a radio system that provides public safety two-way radio communications throughout the state. Over the past several years, the NCSHP has extended coverage and expanded interoperability to include local jurisdiction public safety agencies. The VIPER system is a common standards-based shared system. Catawba County sees the NCSHP VIPER system as a way to achieve statewide interoperability and views participation in the project as a very beneficial partnership with the State.

VIPER Quick Facts

- 238 total sites planned for statewide coverage.
  120 sites constructed and on-the-air
  81 sites are fully funded and under construction
  37 sites remaining to be funded and built

- VIPER estimated to cost $189 million
  $107 million funded to date
  $ 81.5 million remains to be funded

- VIPER is 50% complete (number of sites) with 120 sites on-the-air
- VIPER infrastructure is 57% funded;
- 43% of VIPER remains to be funded
- 32,000 users are currently on the VIPER Network
- 150 Emergency Responding agencies (including federal, state and local agencies) makeup the 32,000 radio users
- SC has the same type Interoperable System; NC/SC can talk to each other using the same type user device.

The County has researched a number of interoperability options, as well as, options to improve the current VHF system. Catawba County believes that the VIPER systems offers an opportunity to convert local public safety communications to 800 MHz system at a much lower cost than could be done alone and on a basis that assures interoperability with other local and state public safety agencies.

All-Hazards Mitigation:

The Charlotte Urban Area (UA) includes the City of Charlotte; the North Carolina counties of Anson, Cabarrus, Catawba, Gaston, Iredell, Lincoln, Mecklenburg, Stanly, and Union; and the South Carolina counties of Lancaster and York. Catawba County is included in the Tactical Interoperable Communications Plan (TICP) for the Charlotte Urban Area and participates in communication and interoperability planning with this group. This plan will strengthen Catawba County's ability to communicate with this group and provide assistance to this area should the need arise.

Catawba County is also an evacuation site for the City of Charlotte and the surrounding metropolitan area. Included in this area is the McGuire Nuclear Plant. Should disaster strike in the Charlotte area, Catawba County would be called upon to house and care for possibly thousands of victims. Evacuation and housing of this many people would require coordination and good communication. The plan enhances Catawba County's ability to deal with such an event.

Funding Plan: Based on 2007 PSIC grant estimates period of performance period (2007-2010).

FY 2007 PSIC Project Proposal Funding Breakdown

	Communication Center 800 MHz Interoperability Upgrade				
Qty	Description	2008	2009	2010	Total
1	16ch Combiner	$ 24,000.00			
1	Card Cage	$ 15,000.00			
1	Aux Card Cage	$ 5,000.00			
8	VIPER Radios (add to 8 available)	$ 56,000.00			
1	Gensac Upgrade - V3 & 16-PORTS	$ 3,000.00			
1	Outdoor Cabinet	$ 3,000.00			
1	Misc Cabling	$ 5,000.00			
1	Misc Antennas	$ 5,000.00			
	Total	$ 116,000.00			
	Labor	$ 22,500.00			
		$ 138,500.00			$ 138,500.00
	Service Agreement	$ 4,500.00	$ 4,500.00	$ 4,500.00	$ 13,500.00
		$ 143,000.00			
1	ACU	$ 18,000.00			
16	Radios	$ 80,000.00			
16	Cables	$ 3,200.00			
		$ 101,200.00			
	Labor	$ 12,000.00			
		$ 113,200.00			$ 113,200.00
	Total By Year	$ 256,200.00	$ 4,500.00	$ 4,500.00	$ 265,200.00
	Total Communication Center 800 MHz Interoperability Upgrade				**$ 265,200.00**

	Field Unit 800 MHz Interoperability Upgrade				
Qty	Description	2008	2009	2010	Total
	Sheriff's Office				
100	Mobile Units		$ 314,715.00		$ 314,715.00
150	Portables		$ 282,915.00		$ 282,915.00
	EMS				
30	Mobile Units (Dual Head)	$ 127,500.00			$ 127,500.00
30	Portables	$ 56,583.00			$ 56,583.00
	Emergency Management				
7	Mobile Units	$ 22,030.00			$ 22,030.00
15	Portables	$ 28,291.00			$ 28,291.00
	Public Health				
1	Mobile Units			$ 3,147.00	$ 3,147.00
4	Portables			$ 7,544.00	$ 7,544.00
	Animal Services				
6	Mobile Units			$ 18,882.00	$ 18,882.00
7	Portables			$ 13,202.00	$ 13,202.00
	Total By Year	$ 234,404.00	$ 597,630.00	$ 42,775.00	$ 874,809.00
	Total Field Unit 800 MHz Interoperability Upgrade				**$ 874,809.00**

	Total Project Costs Breakdown by Year				
		2008	2009	2010	Total
	Total Project Costs	$ 490,604.00	$ 602,130.00	$ 47,275.00	$ 1,140,009.00
	Project Revenue Breakdown by Year				
		2008	2009	2010	Total
	Total Project Costs	$ 490,604.00	$ 602,130.00	$ 47,275.00	$ 1,140,009.00
	20% Local Match	$ 98,120.80	$ 120,426.00	$ 9,455.00	$ 228,001.80
	5% Additional Local Match	$ 24,530.20	$ 30,106.50	$ 2,363.75	$ 57,000.45
	Funding Needed After Match	**$ 367,953.00**	**$ 451,597.50**	**$ 35,456.25**	**$ 855,006.75**
	Total	**$ 490,604.00**	**$ 602,130.00**	**$ 47,275.00**	**$ 1,140,009.00**

Added to PSIC grant estimates period of performance period (2007-2010).

		Field Unit 800 MHz Interoperability Upgrade				
	Qty	Description	2008	2009	2010	Total
		Fire Departments				
	70	Mobile Units		$ 203,000.00		$ 203,000.00
	420	Portables		$ 840,000.00		$ 840,000.00
		Rescue				
	18	Mobile Units		$ 52,200.00		$ 52,200.00
	60	Portables		$		$

				120,000.00		120,000.00
		Total By Year	$ -	$ 1,215,200.00	$ -	$ 1,215,200.00
		Total Field Unit 800 MHz Interoperability Upgrade				**$ 1,215,200.00**

Milestones: Based on 2007 PSIC Grant (Grant funds not awarded until Fall 2008)

FY 2007 PSIC Project Milestone Breakdown (Updated to reflect January 2009 status)

Communication Center Milestones	1/1/2009	6/30/2009
Order equipment for the Communication Center 800 MHz Interoperability Upgrade	1/1/2009	1/31/2009
Install equipment for the Communication Center 800 MHz Interoperability Upgrade	3/1/2009	4/30/2009
Training for Communication Center on 800 MHz equipment	5/1/2009	6/30/2009
Communication Center 800 MHz Operational		6/30/2009
EMS Milestones	5/1/2009	12/31/2009
Order equipment for EMS Field Unit 800 MHz Interoperability Upgrade	5/1/2009	5/31/2009
Install equipment for EMS Field Unit 800 MHz Interoperability Upgrade	7/1/2009	8/31/2009
Training for EMS Personnel on 800 MHz equipment	9/1/2009	10/31/2009
EMS 800 MHz Operational		12/31/2009
Emergency Management Milestones	5/1/2009	12/31/2009
Order equipment for Emergency Management Field Unit 800 MHz Interoperability Upgrade	5/1/2009	5/31/2009
Install equipment for Emergency Management Field Unit 800 MHz Interoperability Upgrade	7/1/2009	8/31/2009
Training for Emergency Management Personnel on 800 MHz equipment	9/1/2009	10/31/2009
Emergency Management 800 MHz Operational		12/31/2009
Fire Service Management Milestones	5/1/2009	12/31/2009
Order equipment for Fire Service Field Unit 800 MHz Interoperability Upgrade	5/1/2009	5/31/2009
Install equipment for Fire Service Field Unit 800 MHz Interoperability Upgrade	7/1/2009	8/31/2009
Training for Fire Service Personnel on 800 MHz equipment	9/1/2009	10/31/2009
Fire Service 800 MHz Operational		12/31/2009

Sheriff's Office Milestones	1/1/2009	6/30/2009
Order equipment for Sheriff's Office Field Unit 800 MHz Interoperability Upgrade	1/1/2009	1/31/2009
Install equipment for Sheriff's Office Field Unit 800 MHz Interoperability Upgrade	3/1/2009	4/30/2009
Training for Sheriff's Office Personnel on 800 MHz equipment	5/1/2009	6/30/2009
Sheriff's Office 800 MHz Operational		6/30/2009
Public Health Milestones	1/1/2010	6/30/2010
Order equipment for Public Health Field Unit 800 MHz Interoperability Upgrade	1/1/2010	1/31/2010
Install equipment for Public Health Field Unit 800 MHz Interoperability Upgrade	3/1/2010	4/30/2010
Training for Public Health Personnel on 800 MHz equipment	5/1/2010	6/30/2010
Public Health 800 MHz Operational		6/30/2010
Animal Services Milestones	1/1/2010	6/30/2010
Order equipment for Animal Services Field Unit 800 MHz Interoperability Upgrade	1/1/2010	1/31/2010
Install equipment for Animal Services Field Unit 800 MHz Interoperability Upgrade	3/1/2010	4/30/2010
Training for Animal Services Personnel on 800 MHz equipment	5/1/2010	6/30/2010
Animal Control 800 MHz Operational		

Plan Risk Factors:

Effective and Appropriate technology: Proven infrastructure is already in place to support an 800 MHz radio solution. The technology is reliable and robust and is being built out by the NCSHP as the interoperable solution for the state. Other counties in the region utilize this technology, and it will also be used by Catawba County to build interoperability. The technology is a common standards-based shared system. Research as to the type of radios to select has been exhaustive and the risk of choosing incorrect technology is low. As there are many vendors that supply similar technologies, the risk of impact if a new vendor were selected would be low.

Proper Funding: Securing a proper funding source is paramount. The County recognizes the importance of this technology and is prepared to participate in the funding of the radio solution. Grant money will be the main source of funding for this project but all funding sources will be explored. Once funded and in place, Catawba County will support the continued operation of the system.

Proper Timeline: Interoperability is of the utmost importance and determining a timeline for rollout of the radio solution is key. As the funding source becomes available a detailed and specific timeline will be developed. The risk of failure will be mitigated as a phased rollout is implemented.

Training and Use: Training of users and use of the system will be done systematically. All users will receive initial and ongoing training on the use of the radios in order to effectively utilize the system. By providing proper training, the system will be utilized efficiently and provide low risk of failure to the project.

Appendix A

Catawba County Government
Technology Strategic Plan
June 2007

Initiative 6.2

Build a reliable communication network that provides for interoperability across the County.
The County has a reliable radio network in place but it is limited by several factors, 1) it is a voter receive system that leaves some areas without communication depending on which tower signals originate from, 2) Hickory has an 800 Mhz system which does not allow for communications between Hickory PD and other emergency services, and 3) there is no data capability in the current system. Each of these areas diminish the level of service that can be provided by Public Safety and need to be addressed.

Catawba County is phasing in an interoperable 800 MHz public safety communications network by capitalizing on partnerships with other local jurisdictions and the North Carolina State Highway Patrol (NCSHP) including actively pursuing State and Federal grant funds. The NCSHP VIPER network was built for public safety interoperability across the State. It works off of an 800 MHz trunked system. Implementation of an 800 MHz radio system will allow Catawba County public safety agencies to seamlessly communicate with each other as well as other public safety agencies in the region and across the State, greatly enhancing their ability to work together to respond to emergency situations. Current coverage in the Catawba County area is good and will provide even more coverage with the addition or upgrade of several tower sites. Catawba County plans to upgrade the E911 Communications Center with capacity to handle sixteen 800 MHz talk groups, an increase from the current 8 talk groups. Doing so will provide the system capacity for public safety agencies to begin using the VIPER infrastructure as radios can be purchased. Law Enforcement and EMS will be targeted first while other agencies continue using the current VHF system. The two systems will be connected in the Communications Center. At the same time, Catawba County will work with the NCSHP to complete the construction of the Riverbend Tower and upgrade the NCSHP tower on Bakers Mountain. Once all public safety agencies are converted to 800 MHz, the existing VHF network will remain in place as a backup for the 800 system.

Catawba County plans to purchase 144 mobile and 206 portable 800 MHz radios over a 3 year period with law enforcement and EMS targeted first. These radios coupled with an increase in 800 MHz talk groups in the Communications Center will enable the Sheriff's Office, EMS, Emergencey Management, Public Health, and Animal Services to begin using the VIPER infrastructure. Other agencies continue using the current VHF system. The two systems will be connected in the Communications Center. At the same time, Catawba County will work with the NCSHP to complete the construction of the Riverbend Tower and upgrade the NCSHP tower on

Baker's Mountain. Once all agencies are converted to 800 MHz, the existing VHF network will remain in place as a backup for the 800 system.

Catawba County Talk Groups

Channel Description	Channel Name	Monitored/Console	Not Monitored/Conso
Catawba SO Dispatch 1	CATSO1	X	
Catawba SO Dispatch 2	CATSO2	X	
Catawba SO CID 1	CATSOCID1		
Catawba SO Ops 1	CATSOOPS1		
Catawba SO Event	CATSOEVT		
Catawba LE Dispatch	CATLEDISP	X	
Catawba LE OPS1	CATLEOPS1		
Catawba LE Common	CATLECOM		X
Conover PD Dispatch	CONOPDDISP	X	
Conover PD OPS1	CONOPDOPS1		
Catawba STAR Team 1	CATSTAR1		
Catawba Narcotics	CATNARC1		
Hickory PD Patch	HICKPDPATCH		X
Lake Norman	LAKENORM		X
Catawba County Fire Dispatch	CATFDDISP	X	
Catawba County Fire Alert	CATFDALERT		X
Catawba County Fire Admin	CATFDADMN		
Hickory Fire Dispatch	HFDDISP	X	
Hickory Fire Admin	HFDADMN		
Catawba Rescue Dispatch	CATRESQDISP	X	
Catawba Rescue Ops	CATRESQOPS		X
Catawba County EMS Dispatch 1	CATEMSDISP1	X	
Catawba County EMS Dispatch 2	CATEMSDISP2		X
Catawba County EMS Ops	CATEMSOPS		
Catawba County EMS Admin	CATEMSADMN		
Catawba County ES 1	CATES1		X
Catawba County ES 2	CATES2		
Catawba County 911	CAT911		X
Catawba County Gen Govt	CATGEN		
Catawba County Common	CATCOMM	X	
Catawba County Mutual Aid	CATMUTAID	X	
Catawba County Tactical 1	CATTAC1		X
Catawba County Tactical 2	CATTAC2		X
Catawba County Tactical 3	CATTAC3		X
Catawba County Tactical 4	CATTAC4		X
Catawba County Tactical 5	CATTAC5		X
Catawba County Tactical 6	CATTAC6		X
Catawba County Tactical 7	CATTAC7		X
Catawba County Tactical 8	CATTAC8		X
Catawba Emergency	CATEMER	X	